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Recap last Show

Our genes are variable not fixed

We are *not predetermined* to have the *same poor health* of our parents. Or, conversely, not the same *good level of health* of our parents either.

It all depends on two things: what health *strengths and weaknesses we inherit* from our parents and what kind of *environment* are we exposing our genes to that will affect their expression or performance.

Six, scientifically documented, *modifiable factors* of *unhealthy aging* have emerged as a result of research conducted over the last decade.

1. Aging related to altered mitochondrial function and oxidative stress
2. Aging disorders as a consequence of increased protein glycation
3. Unhealthy aging as a consequence of chronic inflammation
4. Contributions of defects in methylation to the aging process
5. Compromised detoxification ability and the risk of disease
6. Altered immunity related to aging

These six topics will be discussed in depth in each of a series of six shows starting with this one on: Mitochondrial dysfunction and oxidative stress.

Mitochondrial dysfunction

Mitochondria are the power plants of the cell. There are hundreds of these power plants in a typical cell. They transform oxygen and nutrients into energy through a process called respiration. This energy is critical for cellular repair, immune system function, nervous and muscle system function, and any other energy requiring process that maintains the organization of the body – our Health!

Mitochondrial dysfunction is a loss of the ability to produce cellular energy efficiently. Scientists describe how this loss of ability to produce cellular energy can be associated with unhealthy aging.

Oxidative Stress - Free Radicals

In 1956 Dr. Denham Harmon proposed the now famous “Free Radical Theory of Aging.” It says that as we age and the oxidative damage the body accumulates over time and results in aging diseases. This may be compared to a rusting and crumbling building that is exposed to even harsher rain and wind. The cumulative effect over time of this buildup of oxidative damage is aging, degeneration, and death.

In 1972 Dr. Harman singled out the mitochondria as key targets of oxidative stress. This has been coined by researcher’s the “*Energy Paradox*” because it’s the site within the cell where we produce energy and excessive free radicals. (Bomb fire analogy)

Today we are going to talk about this *cellular energy dysfunction* and *free radical stress* in the context of two of the most feared diseases of unhealthy aging: *Heart Disease & Alzheimer's Dementia*. We'll also show you how taking certain supplements like: *CoQ10*, *Acetyl-L-Carnitine*, and *Alpha Lipoic Acid* can play a role in prevention and as supportive therapies in these diseases.

CoQ10

CoQ10 is a vitamin-like substance that is used our cells to produce ATP, the *chemical fuel* that sustains life down to the cellular level. It's found in small quantities in a large variety of foods and it is also made in the body. It not only facilitates energy production in the cells, but also functions as an antioxidant - giving it much of its value to improve ones health. It has no known toxicity or side effects – it's extremely safe!!!

COQ10 levels decrease with age. Older adults have only 50 % of the COQ10 that young adults have. Depletion: by reduced capacity to make COQ10 in the body & increased oxidation of COQ10 in the mitochondria.

Inevitable conclusion: if COQ10 deficit results in lower mitochondrial energy production, supplementation with COQ10 can preserve mitochondrial function and reduce the risk for aging diseases like heart disease, cancer, and neuro-degenerative diseases like Alzheimer's and Parkinson's disease.

Results of some researchers suggest that a *heart attack* is *caused by a CoQ10 deficiency*.

Other symptoms include: angina, cardiac arrhythmias, mitro-valve prolapse, high blood pressure (which can lead to stroke), gum disease, low energy, a weak immune system (which may result in a greater risk for cancer), and more recently CoQ10 is connected to brain health (indicating it may be preventative agent for Parkinson's and Alzheimer's disease.)

According to Ross Pelton PhD et al, in their book: Drug-Induced Nutrient Depletion Handbook, *Medications that deplete CoQ10 include:* tricyclic antidepressants such as Elavil and Tofranol, the anti-psychotic drug Haloperidol, cholesterol-lowering statin drugs such as Lovastatin and Pravastatin, beta-blockers, anti-diabetic drugs such as Glucotrol and Micronase, and the anti-hypertensive drug Clondine.

It is available at Life Extension Nutrition Center where we carry only the highest quality pharmaceutical grade CoQ10 from Japan.

It is specially formulated in an oil base with Tocotrienol Vitamin E's for protection and delivery into the cells.

Most people are going to want to take between 200-300 mg/day to derive the protection offered from research.

Acetyl-L-Carnitine

Acetyl-L-Carnitine is classified as an amino acid, a simple protein. Although it was originally misclassified because it was later found to not fit the molecular structural requirements of an amino acid. The name seems to have stuck. It's actually more a vitamin-like nutritional compound. Similar to Choline, one of the B vitamins, and like B vitamins it helps us turn food into energy.

As humans, we synthesize a small amount of carnitine from the amino acid lysine (up to approx 25%.) The rest has to come from diet and dietary supplements. Meat, fish, eggs, cheese and other animal products in general contain Carnitine. Mutton and Lamb are particularly rich sources, followed by beef. Plants contain the smallest amount of Carnitine, with the exception of advocados and tempeh.

The average intake a day by Americans is about 30 to 50 mg/day. Strict vegetarians are likely to be especially deficient in Carnitine. Hardly anyone gets the 250-500mg/day of Carnitine that is regarded as optimal by experts. You would have to eat two pounds of beef a day to get 500mg of Carnitine.

It would be a good idea to supplement at least 500mg/day of Actyl-L-Carnitine, the most bio-available form in the body. Those concerned about heart disease and Dementias like Alzheimer's should consider 2000-3000mg/day according to published research.

Alpha Lipoic Acid

Alpha Lipoic Acid is a powerful antioxidant on its own but also because it helps to recycle vitamin C and E after they have been expended to quench harmful free radicals themselves.

Alpha Lipoic Acid is the only antioxidant that can significantly increase the body's production of Glutathione, a powerful antioxidant that has immune system regulating functions. Alpha Lipoic Acid increases the absorption and effectiveness of CoQ10 and is fat and water soluble.

It's been used safely in Europe for over thirty years as a natural treatment for peripheral nerve degeneration and to aid diabetics in controlling their blood sugar levels. It can help the liver detoxify pollutants and help the body rid itself of heavy metal toxicity. It can block cataract formation, protect the brain from degeneration, and reduce cholesterol levels.

According to Dr. Lester Packer, professor of molecular and cell biology, at UCLA Berkley said: *"ALA could play an important role in the prevention and treatment of chronic degenerative diseases such as diabetes and cardiovascular disease."*

Heart Disease – #1 Killer of Americans

Heart one of the most energy intensive organs in the body.

- A. Heart requires *adequate supply* of *oxygen and nutrients continually*.
- B. Most concentrated organ in the body of *CoQ10*, next to the brain.
- C. *CoQ10* deficiency is commonly seen in patients with heart failure.

- D. **CoQ10** can slightly *reduce blood pressure* while *dramatically improving insulin and glucose metabolism*.
- E. **CoQ10** can *reduce triglycerides* and can *significantly increase HDL cholesterol*.
- F. **CoQ10** utilizes *fats* to make energy more so than any other organ tissue in the body.
- G. **Burning fat** for energy in the mitochondria *requires adequate amounts of carnitine* in the body.
- H. **Carnitine shuttles fats into the mitochondria** of heart cells to burn for energy.
- I. Most Americans over the age of 40 have a progressive decline in the amounts of Carnitine.
- J. FDA has approved **Carnitine** for *cardiomyopathy and congestive heart failure*.
- K. **Acetyl-L-Carnitine** is documented to help *lower triglycerides*.
- L. **Acetyl-L-Carnitine** improves circulation and helps heart cells perform better when circulation is poor.
- M. **Acetyl-L-Carnitine** has been shown clinically to help *arrhythmias*.
- N. **Acetyl-L-Carnitine** improves insulin sensitivity and lowers level of glycosylated hemoglobin.
- O. **Alpha Lipoic Acid** is a potent antioxidant that can quench lipid peroxides which is a natural byproduct of burning fats for energy in heart cells.
- P. **Alpha Lipoic Acid** aids **CoQ10** in the energy production process.
- Q. **Alpha Lipoic Acid** increases NO which helps relax constricted arteries improving blood flow to the heart.
- R. **Alpha Lipoic Acid** can help protect organs from sugar damage; i.e. Kidney disease from diabetes which increases risk for heart disease.

Alzheimer's Disease

The brain is a very energy intensive organ and requires high energy output like the heart.

Unlike the heart, the brain cannot store glucose for fuel so it needs a steady blood supply of oxygen and nutrients to make adequate amounts of energy.

The brain, by structure over 50% fat. As we age, these fats become more susceptible to oxidation by free radicals and drop energy by poison mitochondria in brain cells.

Recent studies have found that the degree of disability in Alzheimer's patients correlates directly with impaired energy metabolism in the brain.

- A. **CoQ10** can drive up mitochondria energy in brain cells.
- B. **CoQ10** is a powerful antioxidant that can quench the free radicals caused by the energy production process in brain cells.
- C. Excitotoxic effects of excessive glutamate happens when energy levels in brain cells drops to dangerously low levels. **CoQ10** can prevent that from happening.
- D. **CoQ10** can protect brain cells from damage caused by a dangerous free radical called peroxynitrite. This generates a highly toxic byproduct called HNE found in high amounts in Alzheimer's diseased brain which kills brain cell directly.
- E. **Acetyl-L-Carnitine** can increase energy in brain cells.

- F. ***Acetyl-L-Carnitine*** increases the amount of neurotransmitters in the brain and enhances their performance by increasing the effectiveness of their receptors.
- G. ***Acetyl-L-Carnitine*** reduces the accumulation of lipofuscin (a metabolic waste product related to lipid peroxidation, seen in high levels in Alzheimer's disease patients.)
- H. ***Acetyl-L-Carnitine*** Boosts CoQ10's performance in building cellular energy.
- I. ***Acetyl-L-Carnitine*** is a potent antioxidant as demonstrated by it's ability to quench the dangerous superoxide radical.
- J. ***Acetyl-L-Carnitine*** shown to reduce degenerative processes in the nervous system, improve memory, and learning ability. (A Brain Drug in Europe & other countries)
- K. ***Acetyl-L-Carnitine*** lowers the amount of inflammation that can build-up and damage brain cells.
- L. According to Robert Crayon in his book *the Carnitine Miracle*: "On a daily bases, ***Acetyl-L-Carnitine*** protects neurons against the ravages of stress. ALC tunes up the nerve tissue so that it can better cope with stress.
- M. In his book, Crayon suggests taking 2 to 3 grams of ***Acetyl-L-Carnitine*** to derive therapeutic amounts for the brain.
- N. ***Alpha Lipoic Acid*** a potent antioxidant and works synergistically with ***CoQ10*** and ***Acetyl-L-Carnitine*** to produce energy in brain cells.
- O. Brain cells are very dependent on adequate glucose and ***Alpha Lipoic Acid*** is a cofactor in converting glucose to energy in brain cells.
- P. ***Alpha Lipoic Acid*** is an unusual antioxidant because it works ***both in water soluble and fat soluble tissues***. Example: Eliminates free radicals in the water compartment of the cells, like Vitamin C, and protect lipids against free radical attack, like Vitamin E.
- Q. ***Alpha Lipoic Acid***, unlike many of the common antioxidants, can quench a wider range of free radicals, giving it the title "The Universal Antioxidant."
- R. ***Alpha Lipoic Acid*** can boost the level of intercellular Glutathione, a potent antioxidant and immune boosting chemical. Glutathione can become depleted by TNF-Alpha, a proinflammatory immune chemical that is associated with increasing many diseases of aging. Alpha Lipoic Acid is one of the only effective ways to increase intercellular glutathione levels to protect from the damaging effects of TNF-Alpha.
- S. ***Alpha Lipoic Acid*** may help prevent Alzheimer's because of it's ability to detoxify heavy metals that can accumulate and damage brain cells.
- T. ***Alpha Lipoic Acid*** has the unique ability to recycle most other intercellular antioxidants.

Conclusion

Don't just rely of the basic antioxidants in your vitamin formula if your concerned about Heart disease and Alzheimer's Disease. Super charge your defenses with the potent antioxidants and cellular energizers CoQ10, Acetyl-L-Carnitine, and Alpha Lipoic Acid.

All of these wonderful supplements are available at Life Extension Nutrition Center in the highest quality and potencies in the world.